ABSTRACT

The invention relates to a GLP-1 derivative including an amino acid sequence of GLP-1(7-35) having deletion, substitution and/or addition of one or more amino acids and having Waa-(Xaa)n-Yaa (in which Waa is Arg or Lys, Xaa is Arg or Lys, n is an integer of 0 to 14, and Yaa is Arg, Arg-NH_2, Lys, Lys-NH_2 or Hse) added to the C-terminus of the peptide having a GLP-1 activity. These derivatives are derivatives highly absorbable via a mucous membrane. In the invention, the GLP-1 derivative can be conferred with resistance to dipeptidyl peptidase IV by substituting amino acid 8 in its GLP-1 amino acid sequence with Ser, or with resistance to trypsin by substituting amino acids 26 and 34 with Gln and Asn, respectively.

The efficiency of absorption of the GLP-1 derivatives of the invention via mucous membranes can be further improved by preparing a composition using a charge-regulated fat emulsion regulated to be negatively charged thereon.